

MOLLUSCA OF SOUTH DAKOTA.

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Inasmuch as practically nothing has been published regarding the Mollusca of this State, I deem it proper to submit a list, prefaced with a few remarks in explanation of the environic conditions for shell-life as they exist today, and to some extent in the past.

During the last decade I have collected quite generally over the State, yet I realize there is much study and work to be done and in time the following list will be greatly increased. However from this locality, one would hardly expect a long list of species.

The surface of South Dakota is usually spoken of as a rolling plain, destitute of timber, except in the Black Hills and the Forest Reserves in the northwest part of the State. There is, however, considerable timber along streams locally over the State, and the eastern part is dotted over with large groves and is really in the humid district ; however, strictly speaking, only the southeastern corner is considered so. Nearly one-half of the State that lies west of the Missouri River, except the Black Hills, is considered semi-arid, and owing to the nature of the soil the surface has been eroded into deep-cut creeks and steppes, and merges into a large area of "badlands".

The average rainfall is about 14 inches in the northwestern part of the State and increases to 30 inches in the southeastern part.

The altitude in the southeastern part is about 1240 feet above sea level and increases toward the west, where at Harney Peak in the Black Hills, it is 7200 feet. However the lowest is 960 feet in the northeastern part around Bigstone Lake where a small area was probably scooped out by the glacier, and drains into the Minnesota River Valley. The balance of the State is drained by the Missouri River which nearly divides the State east and west. The eastern half is drained from north to south by the Big Sioux, Vermillion and James rivers. The western half is drained from west to east by the White, Cheyenne,

Moreau and Grand rivers. A very small portion in the north-western part is drained by the Little Missouri River which flows north into the Missouri.

There are no lakes or ponds in the western half of the State, and the small creeks are dry most of the year. There are number of small lakes and ponds in the eastern part, formed by the glacier scooping out depressions and damming up small valleys.

The lakes, ponds and rivers east of the Missouri River abound with shell-life characteristic of the northern region. Owing to the velocity of the current and the rapid deposition of sediment, no shell-life exists in the Missouri River. For the same reason, and the presence of alkaline substances, the same is true of most of the rivers flowing into it from the west. In the north fork of the Grand River, well up toward the head in Perkins County and in the "Ft. Benton loam", I found *Anodonta grandis* and *Sphærium striatinum* var. *acuminatum*. Just east of the Black Hills, in Washabaugh County, in the Yellow Medicine Creek, I collected *Anodontoides ferussacianus* and *Sphærium sulcatum*. I think that the former may be found in several creeks in the Pine Ridge Reservation where the creek-bed is still in the "Pine Ridge loam". In fact they were reported from two other creeks by Indians whom I talked with last August, and who said they "had roasted and eaten 'em". I have found several species of very old "recent" clam shells along terraces of the first floodplain of a number of these "badland" creeks and rivers, which proves that, before the streams eroded down into the Tertiary or Cretaceous clays, they were inhabited by mussels.

The Black Hills, in the southwestern part of the State, is a dome-shaped mountain 100 miles long and 50 wide, from 5000 to 7200 feet above sea level. The higher elevations are covered with pine timber and lower down along the spring-fed creeks are deciduous trees and thickets. The rainfall is one-third more than on the surrounding plains. There are no lakes, and most of the streams are not congenial for shell-life on account of the extremely rapid current. From a collector's standpoint the Black Hills were a disappointment to me. Perhaps I expected too much. But there is a field for more work and especially

among the limestone ridges on the western slope. In the northern part of the Black Hills in Lawrence County, in Spearfish Canyon and about on the dividing line between the deciduous and pine woods, I found *Oreohelix cooperi* very abundant on Sept. 29, 1912. A light snow covered the higher elevations and the snails had hibernated; however I soon located them under leaves, brush-heaps and logs. I think this is the most eastern locality that they have been found. You will notice several species listed from the Black Hills that are identical with those found in the Rocky Mountain region. Mr. Vanatta writes that "it seems that some of the shells found in New Mexico run up the mountains into Colorado, and to the Black Hills in South Dakota." Of course the environments would be very similar.

In the eastern part of the State, the lakes or rather the natural ponds, or "sloughs" as they are locally called, seem to be the natural habitat for some of the species of *Lymnaea* and *Planorbis*. In Deuel County in the "Cotteau Hills" where these "sloughs" are numerous and shallow and practically grown up with vegetation, I have found them exceedingly abundant and of large size. Many wildducks nest here, and during migration others stop to feed, so that in season, hunting is good. I remember one small "slough" in particular, in the fall of 1916, that seemed literally full of *Lymnaea stagnalis* and *Planorbis trivolvis*, that we called "Spoonbill Slough" from the fact that this variety of duck was always to be found there. We seldom shot them, as better ducks were plentiful; but now I often regret that I did not think enough of it at the time to take a few and examine their "crops" to see if they were feeding on the young of *L. stagnalis*, which were abundant. It was also in this locality in 1908 that I found the dead specimens of *Segmentina christyi*. No live ones were there at the time, as the "slough" had been dry a year or two previous. Nor could I find them at any other pond. This was the first record for the United States, and as Mr. Bryant Walker says, "They probably came from Canada by the duck route".

(To be concluded.)